

Freshwater Mussel Community Response to a New Industrial Discharge



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Overview:

- Background
- Study area
- Study design
- Recon data





Background Sabine River freshwater mussels:

- Basin wide 33 species (Howells et al. 1996)
- Sensitive to pollution
- Four state threatened species
- Mussel sanctuaries
- Study area 16 species during recon trips

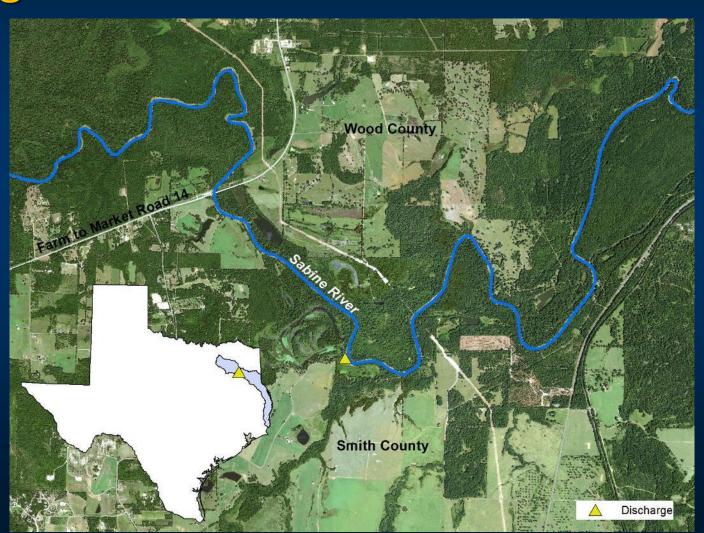


Background New industrial discharge:

- Poultry processing facility (2.18 MGD)
- Permit limits:
 - Total nitrogen 97.0 mg/L
 - Ammonia nitrogen 3.94 mg/L
- Report total phosphorus
- Expected to begin in 2019



Study area Sabine River below Lake Tawakoni Segment 0506



Study design Objectives:

- Describe the mussel community above and below discharge
- Document changes in mussel community after discharge commences



Study design Approach:

- Sample mussels and WQ for four years
- Two sites upstream of discharge
- Two sites downstream of discharge
- Publish findings



Study design Freshwater mussel surveys:

- Qualitative
- Quantitative
- Juvenile growth and survivorship





Study design Qualitative surveys:

- Assessing community structure
- Once a year at each site
- 150 m² search areas per mesohabitat
- Minimum of four person-hour timed search periods



Study design Quantitative surveys:

- Mussel densities and population dynamics
- Once a year at each site
- Two 150 m² sampling areas per site
- 20 random 0.25 m² quadrats
- Mussels tagged for recapture
- State listed species also PIT tagged
- Mussels measured and weighed



Study design Juvenile growth and survivorship:

- Collect gravid Texas pigtoes from study area
- TAMU Mussel Lab will infect host fish with glochidia
- Transformed juveniles will be utilized in cage/silo experiments downstream of discharge



Study design Water and sediment quality:

- Sampled quarterly
- Continuous physicochemical WQ
- Nutrient parameters
- Pore water ammonia nitrogen

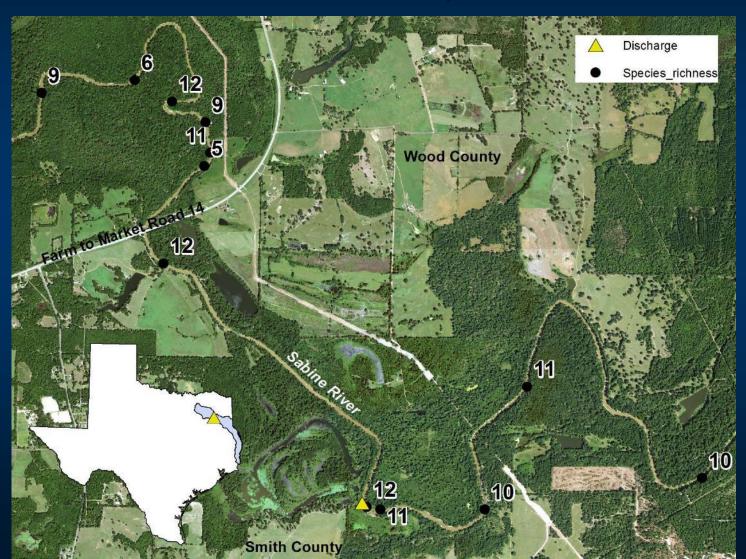


Additional nutrient analysis HACH DR900 colorimeter:

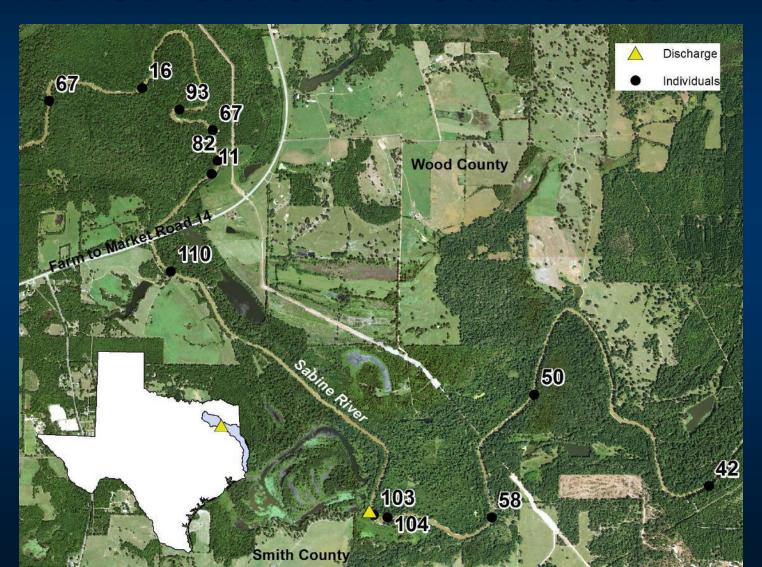
- Results in the field
- Allow for frequent sampling
- Compare field results with lab analysis



Recon data One hour searches — species richness



Recon data One hour searches — abundance



Recon data Quantitative quadrat sampling - density

Quadrat sampling yielded 14.8 mussels per m²

